CLAIMS

1. An adaptive feed-back controlled system for regulating a physiological function of a body, comprising:

- at least one sensor for continuously monitoring a significant physiological performance;
- a learning neural network module for receiving and processing information of said at least one sensor and for learning at least one physiological aspect of said body;
- a deterministic algorithmic module receiving parameters from said neural network module and for supervising online said learning module, and
- a therapeutic delivering means connected to said deterministic algorithmic module and wherein said .

2. A system according to claim 1 wherein said modules and therapeutic delivery means are implanted, constituting an adaptive cardiac resynchronization therapy device, delivering biventricular pacing with adaptive AV delay and VV interval, modified

continuously with correlation to the hemodynamic performance of the heart.

3. A system according to Claim 1 wherein said neural network network module employs a spiking neuron network architecture.

4. A system according to Claim 3 wherein said neural network network module employs a spiking neuron network architecture implemnted as a silicon processor operating at with extremely low clock frequency.

5. A system according to claim 1 wherein said neural networks module is external.

6. A system according to claim 1 wherein said at least one sensor is a non invasive sensor.

7. A system according to claim 1 wherein said therapeutic delivery system is connected to said algorithmic module via a wireless communications link.

8. A system according to claim 1 wherein said therapeutic delivery means are at least one selected from the group consisting of

pacemaker, defibrillator, brain stimulator and controlled drug delivery systems.

9. A method for regulating a controlled delivery of a physiologically active agent to a patient comprising the steps of:

- obtaining continuous signal from at least one sensor monitoring said patient;
- processing said continuous signal by an algorithmic processing module and a learning module, and wherein said learning modules carries out adaptive learning in connection with said at least one sensor is first supervised by applying an accepted set of parameters , and
- affecting a delivery module in accordance with said processing, wherein said affect either results from said algorithmic process or from said learning processing.

10. A method for regulating a controlled delivery of a physiologically as in claim 9 wherein said learning module is a neural network module.

11. A method for regulating a controlled delivery of a physiologically as in claim 10 wherein said synaptic weight change is a Hebbian.

12. A method for adaptive biventricular pacing control comprising the steps of:

- programming initial AV (atriaventricular) delay parameter and VV (interventricular delay) interval parameter of an algorithmic module;
- operating in normal CRT mode wherein an algorithmic deterministic module for controlling delivery of pulses, wherein pacing is carried out according to said parameters and wherein learning operation with said parameters takes place, and
- transition to adaptive CRT mode wherein said AV delay and VV interval change dynamically in order to achieve optimal hemodynamic performance, and wherein said adaptive mode is limited to perform in a predefined low limit of hemodynamic performance.

13. A method for adaptive biventricular pacing control as in claim 12 wherein the condition of the heart is classified continuously based on the information of a hemodynamic sensor wherein a maximal tracking rate is surpassed.

14. A method for adaptive biventricular pacing control as in claim 13 wherein said information relates to implanted ventricular pressure sensor.

15. A method for adaptive biventricular pacing control as in claim 13 wherein said information relates to ventricular impedance implanted sensor.